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Note

Collecting and eating *Liphyra brassolis* (Lepidoptera: Lycaenidae) in southern Thailand

The myrmecophagous lycaenid *Liphyra brassolis* Westwood, 1864, also known as the moth butterfly, has a broad distribution from northern India, South East Asia, Indonesia, the Philippines, New Guinea, and the Solomon Islands to northern Australia (Samson & Smart, 1980), and a second species, *L. grandis* Weymer, 1902, is endemic to mainland New Guinea (Parsons, 1999). The larvae of both butterfly species feed on the brood of weaver ants, *Oecophylla smaragdina* (Fabricius, 1775) (Johnson & Valentine, 1986; Parsons, 1999). These ants are ubiquitous in lowland tropical forests throughout the Indo-Australasian region where they construct large arboreal nests by stitching together foliage with larval ant silk (Hölldobler & Wilson, 1990; Azuma *et al.*, 2006). Adult butterflies are mostly crepuscular and, in contrast with their host ants, are rarely seen or collected, thus collection records are scant and there are many gaps in what is probably a more or less continuous distribution of *L. brassolis* coincident with the distribution of *O. smaragdina*. In Thailand, *L. brassolis* is known from single specimens collected at several locations (Fig. 1) and there are a few records from further south on the Malay Peninsular (e.g. Corbet & Pendlebury, 1992; Samson & Smart, 1980; Westwood, 1864). At the Center for Tropical Forest Science (CTFS) research site at Khao Chong in southern Thailand (7°33'N, 99°48'E), *O. smaragdina* ants are commonly seen, so it was thought that the moth butterfly may occur in the area.

Rather than opening *O. smaragdina* nests, we attempted to track down *L. brassolis* in and around Khao Chong by asking local people if they had seen the caterpillars. Throughout most of the range of *O. smaragdina*, their larvae and pupae are harvested for human consumption, medicine, bird feed or fish bait (Bingham, 1903; Bequaert, 1921; Césard, 2004; Sribandit *et al.*, 2008) and this is particularly so in Thailand where the ants are known locally as 'red ants' and are a popular delicacy. Harvesting is done using a long pole with a bag or basket attached to the end. The bag is positioned under an *O. smaragdina* nest and shaken vigorously causing the nest to rupture and ant brood to drop into the bag (Fig. 2). We asked local people to look for large orange colored inquilines

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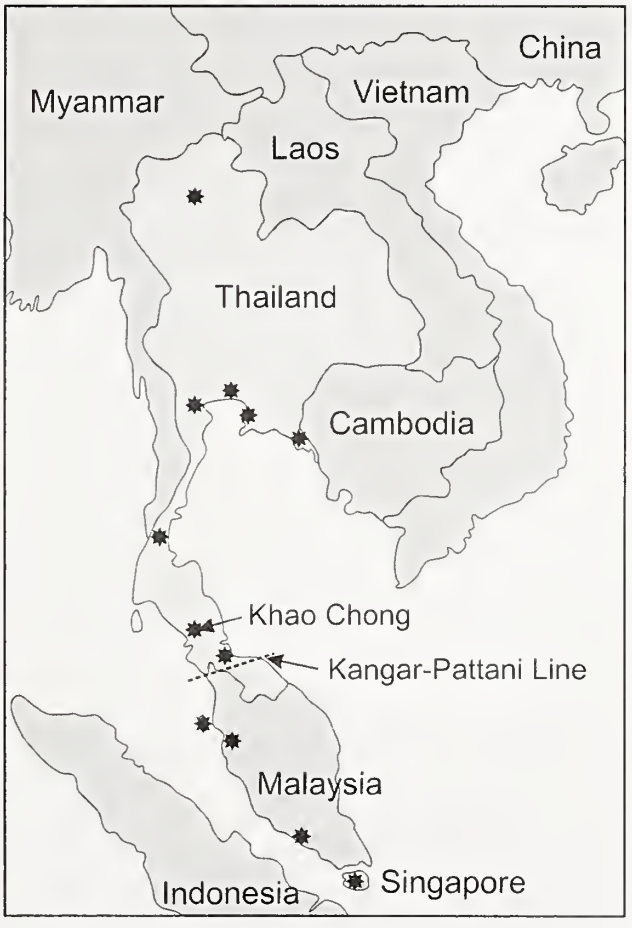

Figure 1. Collection locations for *L. brassolis* in Thailand and Peninsular Malaysia (Corbet & Pendlebury, 1992; Ek-Amnuay, 2006; Godfrey, 1930; Inayoshi, 2010; Pinratana, 1981; Samson & Smart, 1980; Westwood, 1864)

among the ant larvae, and offered a small reward to anyone who found one and brought it to us. As a result, during the ant-harvesting season at the end of February-early March 2010 we obtained two larvae and two pupae from within or near the Khao Chong Research and Conservation Promotion Station. These produced a male and a female *L. brassolis* (see Fig. 3); one larva was preserved in ethanol (Fig. 4) and the fourth one failed to eclose. The larva in Fig. 4 was collected by one of us (MR) on February 12, 2010 from an ant's nest in a Mangosteen tree, *Garcinia mangostana* Linnaeus, 1753, using local ant harvesting methods (Fig. 2). Fifteen ant's nests were harvested before the *Liphyra* larva was found.

As part of the CTFS insect monitoring program at Khao Chong, butterflies are being DNA barcoded as a taxonomic tool and for future genetic studies. Thus, tissue samples comprising a single leg or small piece of larval tissue were placed in 95% ethanol and sent to the Barcode of Life Data Systems (BOLD) (Ratnasingham & Hebert, 2007) where the 5' end of the mitochondrial gene, cytochrome *c* oxidase subunit 1 (barcode sequence) was characterized. Collection data and barcode sequences for the *L. brassolis* specimens are as follows. Male (Fig. 5) specimen number KHC6101; Khaobantot Mts, 236 m, Khao Chong, Trang Province, Thailand; 12 iii 2010; Kongnoo, Tongrod & Rienkaw; BOLD barcode accession number KHCBT180-10. Female specimen number KHC5981; same data as male except dated March 2010; BOLD barcode accession number KHCBT179-10. Larva (Fig. 4) specimen number KHC6141; same data as male; BOLD barcode accession number KHCBT482-10. Sequence variation among specimens from Khao Chong (0.152% - 0.456%) is consistent with the average within-species range for other tropical Lepidoptera (Hajibabaei *et al.*, 2006). All specimens are housed at the CTFS field station in Khao Chong but will be vouchered in the Forest Insect Collection of the Thailand Department of National Parks, Wildlife and Plant Conservation, Bangkok.

Adult *L. brassolis* at Khao Chong key to the nominate subspecies '*brassolis*' (Strand, 1911) and are remarkably consistent with photographs of specimens from Chang Mai, which are also recorded as subspecies '*brassolis*' (Ek-Amnuay, 2006). Specimens from peninsular Malaysia and Singapore, recorded as *L. brassolis abbreviata* (Corbet & Pendlebury, 1992), differ in having the black terminal band on the dorsum of the forewing in both sexes extending only part way to the base. It is uncertain where the subspecies' boundary lies, but based on available data, it is assumed to be the Kangar-Pattani Line. This line runs

Figure 2. Red ant harvesting in southern Thailand.

west-east from Kangar, Malaysia to Pattani, Thailand at about 7° N and is the most widely accepted position for the Indochinese-Sundaic boundary (Woodruff, 2003). Additional specimens and barcode sequences of *L. brassolis* from Peninsular Malaysia may help to resolve the subspecies' boundaries, and to test if DNA sequence variation parallels the differences in wing patterns.

When shown photos of *L. brassolis* larvae and told that they are found in 'red ant' nests, many local people stated they had eaten them. They thought the butterfly larvae were 'big' ants or 'queen' ants and were just as tasty as the other ant larvae, although the desirability of eating 'big ants' was variable among those people we asked. Entomophagy by humans is widespread in developing regions and some 240 species of Lepidoptera, mostly moth larvae, are known to be eaten (Ramos-Elorduy & Menzel, 1998); however, this may be the first documented record of lycaenid larvae being consumed intentionally as food. Furthermore, it is likely that 'big ants' (i.e. *L. brassolis* larvae) are encountered by ant harvesters in other parts of the *O. smaragdina* range; for

Figures 3-5. *Lyphyra brassolis*. **3**. Male (upper) and female *Liphyra brassolis* from Khao Chong, Thailand. Scale bar is 1 cm. **4**. Dorsal view of *L. brassolis* mature larva from Khao Chong. Scale bar is 1 cm. **5**. Adult male imago *L. brassolis* at Khao Chong.

example, ant harvesters in Cambodia recently located several *L. brassolis* caterpillars for a photo journalist (Mark Moffett, personal communication). Thus it is suggested that ant harvesters throughout the range of *O. smaragdina* may be a valuable source of distributional data and genetic material for the elusive moth butterfly.

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Literature cited

Azuma, N., K. Ogata, T. Kikuchi & S. Higashi. 2006. Phylogeography of Asian weaver ants, *Oecophylla smaragdina*. Ecological Research 21: 126–136.

Bequaert, J. 1921. Insects as food: How they have augmented the food supply of mankind in early and recent times. Natural History Journal 21: 191–200.

Bingham, C. T. 1903. The fauna of British India, including Ceylon and Burma. Hymenoptera Volume 2. Ants and Cuckoo-Wasps. Taylor & Francis, London. 506 pp.

Césard, N. 2004. Harvesting and commercialisation of kroto (*Oecophylla smaragdina*) in the Malingping area, West Java, Indonesia, pp. 61-77. *In*: Kusters K & B. Belcher (eds.), Forest Products, Livelihoods and Conservation. Case Studies of Non-Timber Product Systems. Volume 1 Asia. Center for International Forestry Research, Jakarta, Indonesia.

Corbet, A. S. & H. M. Pendlebury. 1992. The butterflies of the Malay Peninsula. Fourth ed. revised by J. N. Eliot. Malayan Nature Society, Kuala Lumpur. 595 pp, 69 pls.

Ek-Amnuay, P. 2006. Butterflies of Thailand. Fascinating insects Vol. 2. (First edition). Amarin Printing and Publishing Public Co., Ltd., Bangkok. 849 pp.

Godfrey, E. J. 1930. A revised list of the butterflies of Siam, with notes on their geographical distribution. Journal of the Siam Society of Natural History Supplement 7(4): 203-397.

Hajibabaei, M., D. H. Janzen, J. M. Burns, W. Hallwachs, & P. D. N. Hebert. 2006. DNA barcodes distinguish species of tropical Lepidoptera. Proceedings of The National Academy of Sciences of the USA 103: 968 –971.

Hölldobler, B. & E. O. Wilson. 1990. The Ants. Belknap Press of Harvard University Press, Cambridge, MA. 732pp.

Inayoshi, Y. 2010. A check list of butterflies in Indo-China: Chiefly from Thailand, Laos & Vietnam. Http://yutaka.it-n.jp/lyc2/80200001.html, updated 2010.07.15.

Johnson S. J. & P. S. Valentine. 1986. Observations on *Liphyra brassolis* Westwood (Lepidoptera: Lycaenidae) in north Queensland. Australian Entomological Magazine 13: 22-26.

Parsons, M. J. 1999. The butterflies of Papua New Guinea: Their systematics and biology. Academic Press, London. xvi+736 pp. 136 pls.

Pinratana, A. 1981. Butterflies in Thailand. 4. Lycaenidae. Viratham Press, Bangkok. viii+216 pp, 36 pls.

Ramos-Elorduy, J. & P. Menzel. 1998. Creepy crawly cuisine: the gourmet guide to edible insects. Park Street Press, Rochester, Vermont. 150 pp.

Ratnasingham, S. & P. D. N. Hebert. 2007. BOLD: The Barcode of Life Data System (www.barcodinglife.org). Molecular Ecology Notes 7: 355-364.

Samson, C. & P. Smart. 1980. A review of the genus *Liphyra* (Lepidoptera: Lycaenidae) of Indo-Australia, with descriptions of two new subspecies from the Solomon Archipelago. The Aurelian 1: 6-16.

Sribandit, W., D. Wiwatwitaya, S. Suksard, & J. Offenberg. 2008. The importance of weaver ant (*Oecophylla smaragdina* Fabricius)

harvest to a local community in Northeastern Thailand. Asian Myrmecology 2: 129-138.

Strand, E. 1911. Beitrag zur Kenntnis der Lycaenidengattung *Liphyra* Westw. Mitteilungen aus dem Zoologischen Museum in Berlin 5(2): 306-309.

Westwood, J. O. 1864. [Untitled note]. Transactions of the Entomological Society of London (3) 2: 31 [31].

Woodruff, D. F. 2003. The location of the Indochinese-Sundaic biogeographic transition in plants and birds. Natural History Bulletin of the Siam Society 51: 97-108.

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